
Taxonomic Notes on *Onobrychis* sect. *Hymenobrychis* (Fabaceae, Hedysareae) in Iran

Massoud Ranjbar, Roya Karamian, and Fatemeh Hajmoradi

Department of Biology, Herbarium Division, Bu-Ali Sina University, P.O. Box 65175/4161,
Hamedan, Iran. Author for correspondence: ranjbar@basu.ac.ir

ABSTRACT. *Onobrychis kuchanensis* Ranjbar, Hajmoradi & Karamian, a singular new species endemic to Iran, is described and illustrated. The new species belongs to *Onobrychis* Miller subgen. *Sisyrosema* (Bunge) Grossheim sect. *Hymenobrychis* DC. *Onobrychis kuchanensis* is distributed in Khorasan Province in northeastern Iran. It is closely related to *O. amoena* Popov & Vvedensky and is distinguished by its corolla neither distinctly striate nor purple maculate and its calyx shorter than 5 mm. The conservation status is evaluated as Vulnerable (VU) according to IUCN Red List criteria. Moreover, *O. amoena* subsp. *meshhedensis* Širjaev & Rechinger is raised to specific rank as *O. meshhedensis* (Širjaev & Rechinger) Ranjbar on the basis of morphological evidence. Relationships between both species and their closest relatives are discussed.

Key words: Fabaceae, Iran, IUCN Red List, *Onobrychis*, sect. *Hymenobrychis*, subg. *Sisyrosema*.

Onobrychis Miller (Fabaceae) comprises about 170 species arranged in 12 sections, mainly occurring in southwestern Asia, the Mediterranean region, and in temperate Europe and Asia (Cronquist, 1981). Some are cultivated as fodder or as ornamentals (Lock & Simpson, 1991; Yakovlev et al., 1996; Mabberley, 1997). In *Flora Iranica*, Rechinger (1984) accepted 54 species in nine sections for Iran: section *Dendrobrychis* DC., section *Lophobrychis* Handel-Mazzetti, section *Onobrychis*, section *Laxiflorae* (Širjaev) Rechinger, section *Anthyllium* Nábelek, section *Afghanicae* Širjaev, section *Heliobrychis* Bunge ex Boissier, section *Hymenobrychis* DC., and section *Insignes* (Širjaev) Rechinger, with two species unassigned. Recently new taxa have been described in *Onobrychis* and *Hedysarum* L., both of the tribe Hedysareae, from Iran (Ranjbar et al., 2004, 2006, 2007a, b, 2010; Ranjbar, 2009). The present paper is focused on a new Iranian taxon from *Onobrychis* sect. *Hymenobrychis*. This section is represented in Iran by 11 species, and is the second largest section in *Onobrychis* subg. *Sisyrosema*.

The species of *Onobrychis* sect. *Hymenobrychis* can be assigned to three different natural groups distin-

guished from each other mainly in the shape and size of flowers. The *O. michauxii* DC. group, characterized by the corolla distinctly striate and the calyx longer than 5 mm, includes the majority of the species (ca. 6 species) belonging to this section. The species of the *O. amoena* Popov & Vvedensky group are distinguished by the corolla with purple maculae and the calyx not exceeding 5 mm. Finally, the *O. kuchanensis* group consists of the single new species described below, which is characterized by corollas neither distinctly striate nor purple maculate and the calyx shorter than 5 mm.

In order to resolve the morphological heterogeneity of the section and the assignment of doubtful specimens, a detailed morphological study has been conducted by the first author on taxa attributed to this section and other related groups. According to our results, *Onobrychis amoena* subsp. *meshhedensis* Širjaev & Rechinger should be raised to specific rank; this is done below. Moreover, our related field research in Khorasan Province in 2007 led to the discovery of unusual plants of a related taxon occurring together with populations of subspecies *meshhedensis* near Kuchan. Studies of living material and herbarium specimens suggest that the new taxon, which occurs exclusively in the Kuchan submountains, is especially close to *O. amoena*. However, morphological differences support its recognition as a new distinctive species, which we describe here.

1. *Onobrychis kuchanensis* Ranjbar, Hajmoradi & Karamian, sp. nov. TYPE: Iran. Khorasan: Sabzevar to Kuchan, 97 km before Sabzevar, 1492 m, 5 June 2007, M. Ranjbar & F. Hajmoradi 12899 (holotype, BASU; isotypes, MO, TARI). Figure 1.

Haec species *Onobrychidi amoenae* Popov & Vvedensky affinis sed ab ea foliis 2- ad 4-jugis (nec 3- ad 7-jugis), stipulis 3–4 mm (nec 8–10 mm) longis, calyce ca. 3 mm (nec 4–5 mm) longo, vexillo neque purpureo-maculato neque purpureo-striato atque alis glabris (nec ciliatis) distinguitur.

Ascending erect to zigzag, glabrous perennial with thick woody rootstock, to 60 cm tall. Stipules thinly free, chartaceous, 3–4 × 1.5–2 mm, triangular,



Figure 1. *Onobrychis kuchanensis* Ranjbar, Hajmoradi & Karamian. —A. Habit with details of flower and pod. —B. Calyx. —C. Standard. —D. Keel. —E. Wings. —F. Androecium. —G. Pistil. —H. Pod. Drawn from the holotype, M. Ranjbar & F. Hajmoradi 12899 (BASU). Scale bar: A = 2 cm; B–H = 1 cm.

acuminate, glabrous in upper parts or sparsely to loosely villous at the base; leaves $5\text{--}15 \times 2\text{--}3$ cm; rachides remote, slender to thickened, straight or curved and ascending, glabrous, petiole 2.6–8 cm; leaflets in 2 to 4 pairs, lanceolate to oblong or elliptic,

round to cuneate at base, acute to acuminate at apex, $7\text{--}30 \times 2\text{--}5$ mm, acute to obtuse at tip, adaxially glabrous, abaxially glabrous to rarely sparsely appressed to ascending hairy. Inflorescence $6\text{--}28 \times 2\text{--}2.5$ cm, narrow, oblong before anthesis, composed of

Table 1. Diagnostic morphological characters of *Onobrychis kuchanensis*, *O. meshhedensis*, and *O. amoena*.

	<i>O. amoena</i>	<i>O. kuchanensis</i>	<i>O. meshhedensis</i>
Height (cm)	40–50	≤ 60	≤ 80
Stem indumentum	shortly appressed pubescent	glabrous	sparsely to completely glabrous
Stipule length (mm)	8(–10)	3–4	5–8
Leaflet pairs	3 to 7	2 to 4	2 to 4
Leaflet indumentum, abaxial surface	shortly appressed pubescent	glabrous	glabrous
Calyx length (mm)	4–5	ca. 3	7–8
Corolla color	yellow with darker purple venation	yellowish green without darker venation or purple maculae	yellow with red maculae
Standard length (mm)	10–11	9–10	7–8
Wing indumentum	± ciliate	glabrous	± ciliate
Keel length (mm)	10–11	ca. 10	ca. 7
Pod indumentum	± toothed	± toothed	toothed

11 to 23 flowers, elongating in fruit; peduncle 5.5–11(–20) cm; pedicels ca. 1.2 mm, with loosely to densely spreading trichomes 0.1–0.5 mm; bracts papery, brown, 1.3–2 × 0.3–0.5 mm, oblong to lanceolate or triangular, acute to acuminate, glabrous to sparsely pubescent; bracteoles narrowly linear, ca. 0.5 mm. Calyx ca. 3 mm, green, ± densely appressed pubescent, 0.1–0.6 mm, teeth ca. 1.8 mm, linear to triangular; corolla yellowish green, without darker venation, standard 9–10 × 8–9 mm; wings ca. 3 mm, shorter than standard and keel; limb ca. 2 × 1.2 mm, briefly oblong, rounded at tip, claw filiform, ca. 1 mm; keel ca. 10 mm; limb ca. 6 × 5.5 mm; claw ca. 4 mm; stamens 8–9 mm, the free portion ca. 3 mm. Pods with a stipe to ca. 1 mm, semiorbicular, pendent, 5–10 × 3–6 mm, hirsutulous, with trichomes 0.2–1.5 mm, foveolate on disc, with setose crest on margin.

Distribution and habitat. *Onobrychis kuchanensis* appears to be extremely restricted in its geographic distribution. It is currently known only from its type locality on the south slope of Mt. Kopet Dag in Iran. It grows in the dry steppe and stony clay terrain of the submountainous region in and around the village of Kuchan; one small population has been observed.

IUCN Red List category. We observed a very low frequency of the new species in its locality, which consisted of no more than 10 plants sparsely scattered near the village. It is therefore evaluated as Vulnerable (VU) according to IUCN Red List criteria (IUCN, 2001) to identify taxa with small populations that could be at risk.

Etymology. The new species is named after the village of Kuchan, in Khorasan Province of northeastern Iran.

Relationships. The isotype material of *Onobrychis amoena* was available at W and the detailed original

description and type photo of *O. amoena* were compared (Popov & Vvedensky, 1927). *Onobrychis kuchanensis* is the closest relative to *O. amoena*, which is also found in Khorasan Province in northeastern Iran. The species are similar in having fewer leaves with leaflets of similar shape and size, and similar pods whose shape and structure affine *O. kuchanensis* to *Onobrychis* sect. *Hymenobrychis*. However, *O. kuchanensis* differs mainly by being completely glabrous or glabrescent, by the shape and indumentum of the standard, and by the type of pod indumentum. Important differences between the new species and its related taxa are presented in Table 1.

2. *Onobrychis meshhedensis* (Širjaev & Rechinger) Ranjbar, comb. et stat. nov. Basionym: *Onobrychis amoena* Popov & Vvedensky subsp. *meshhedensis* Širjaev & Rechinger, Feddes Repert. 48: 45. 1940. TYPE: Iran. Khorasan: “in tractu australi montium inter Robat-e Safid et Torbate- Heydariyeh,” 10 July 1937, K. H. Rechinger 1575 (holotype, W).

Onobrychis meshhedensis is recognized at the species rank for those plants previously treated as *O. amoena* subsp. *meshhedensis*; it is distinguished from *O. amoena* by its glabrous morphology and larger habit. *Onobrychis meshhedensis* is an endemic species known from the submontane regions from 1492 to 2000 m elevation near Mashhad, Sabzevar, Torbate-Heydariyeh village in northeastern Iran. In this region, *O. meshhedensis* forms relatively sparse populations, but it is one of the region’s most frequently observed *Onobrychis* species.

Specimens examined. IRAN. **Khorasan:** Chehel-dokhtar, Gor Khod (Gur-chal) Pro. Reg., Dasht Aheh (Ahu?), M. Moussavi & A. Karavar 33603 (IRAN, W); Robate-Safid inter Mashhad et Torbate-Heydariyeh, J. Renz & H. Runemark

55964 (W), K. H. Rechinger 1536 (W), Rechinger 4409 (W), Rechinger 55873 (W); Bardu Forest, W. N. Koelz 16760 (W); Yoghatay, 20 km N of Sabzevar, Rechinger 53672 (W); Sabzevar to Esfarayen, Afchang village, M. Ranjbar & F. Hajmoradi 13632 (BASU); Sabzevar to Esfarayen, Ranjbar & Hajmoradi 13641 (BASU); Sabzevar to Kuchan, 97 km before Sabzevar, Ranjbar & Hajmoradi 13642 (BASU); Torbate-Heydariyeh, Moajen valley, M. Ayatollahi & H. Zangooei 14594 (FUMH), G. Faghihnia & H. Zangooei 19059 (FUMH); Torbate-Heydariyeh, Yarfazli valley, Faghihnia & Zangooei 22286 (FUMH).

Acknowledgments. The first author thanks Ernst Vitek, Bruno Wallnofer, and Walter Till for their help during his visit to W and WU in Vienna. We are grateful to Victoria C. Hollowell (MO) for revising the manuscript, as well as for her useful comments and suggestions. This research received financial support from Bu-Ali Sina University. We thank the directors of FUMH and TARI for specimen loans and Mitra Hezarkhani for preparing the illustration.

Literature Cited

- Cronquist, A. 1981. An Integrated System of Classification of Flowering Plants. Columbia University Press, New York.
- IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.
- Lock, J. M. & K. Simpson. 1991. Legumes of West Asia. Royal Botanic Gardens, Kew.
- Mabberley, D. J. 1997. The Plant-book, A Portable Dictionary of the Vascular Plants, 2nd ed. Cambridge University Press, Cambridge.
- Popov, M. & A. I. Vvedensky. 1927. Universitate Asiae Mediae editum. Fasc. XI, Januarius a.
- Ranjbar, M. 2009. *Onobrychis oshnaviyehensis* sp. nov. (sect. *Hymenobrychis*, Fabaceae) from Iran. Nord. J. Bot. 27: 1–5.
- , H. Amirabadizadeh, R. Karamian & M. A. Ghahremani. 2004. Notes on *Onobrychis* sect. *Heliobrychis* (Fabaceae) in Iran. Willdenowia 34: 187–190.
- , R. Karamian & M. R. Johartchi. 2006. Notes on the taxonomy of *Hedysarum* (Fabaceae) in Iran. Ann. Bot. Fenn. 43: 152–155.
- , ——— & N. Olanj. 2007a. A new species of *Hedysarum* (Fabaceae) in Iran and other new *Hedysarum* records. Bot. J. Linn. Soc. 155: 505–512.
- , ———, Z. Tolui & H. Amirabadizadeh. 2007b. *Onobrychis assadii* (Fabaceae), a new species from Iran. Ann. Bot. Fenn. 44: 481–484.
- , ——— & E. Vitek. 2010. An interesting new species of *Onobrychis* sect. *Hymenobrychis* (Fabaceae). Ann. Bot. Fennici. (in press).
- Rechinger, K. H. 1984. *Onobrychis*. Pp. 389–459 in K. H. Rechinger (editor), Flora Iranica, Vol. 157. Akademische Druck-u.-Verlagsanstalt, Graz.
- Yakovlev, G. P., A. K. Sytin & J. R. Roskov. 1996. Legumes of Northern Eurasia, a Check-list. Royal Botanic Gardens, Kew.